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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,475	08/26/2003	Lim Su Lee	8733.311.10-US	2307

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MCKENNA LONG & ALDRIDGE LLP  
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WASHINGTON, DC 20006

EXAMINER
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MARKOFF, ALEXANDER

ART UNIT	PAPER NUMBER
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1711

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11/23/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/647,475	<b>Applicant(s)</b> LEE, LIM SU	
	<b>Examiner</b> Alexander Markoff	<b>Art Unit</b> 1711	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 13, 16, 18, 28-30, 32, 34-37 and 45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13, 16, 18, 28-30, 32, 34-37 and 45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 45 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
3. The applicants filed new claim, which requires moving side surfaces and moving the upper and lower surfaces. Such is not limited to the moving the substrate having the side surfaces and the upper and lower surfaces, which is disclosed by the original specification. Thereby, the original specification does not support the entire scope of the new claim.
4. Claim 45 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim is indefinite because it is not clear what is referenced by “having including”. Is some text missing?

The claim is further indefinite because it is not clear what is referenced by  
“moving first and second opposing side surfaces among the four side surfaces.

How can the surfaces be moved among the surfaces?

The claim is further indefinite because it is not clear what is referenced by  
“rotating the first and second side brushes by rotation direction”. How can the  
brushes be rotated “by rotation direction”?

The claim is also indefinite because the term “the moving direction of the  
substrate” lacks proper antecedent basis.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all  
obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148  
USPQ 459 (1966), that are applied for establishing a background for determining  
obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 13, 16, 18, 28-30, 32 and 34-37 are rejected under 35 U.S.C. 103(a) as  
being unpatentable over Moinpour et al (US Patent No 5,901,399) in view of Fishkin et

al (US Patent No 6,202,658), Hashimoto et al (US Patent No 6,261,378) and the state of the prior art admitted by the applicants in the specification.

Moinpour et al and Fishkin et al both teach cleaning substrates with brushes and sprays. Both documents are concern about cleaning side surfaces of the substrates during cleaning of the main surfaces. Both documents teach brushing of the main surfaces and spraying the side surfaces. Moinpour et al teach the use of cylindrical brushes and a liquid jet to clean the side surfaces. See at least Figures 2c, 3, 6 and 7 and the related description. The document does not specify whether or not the liquid jet is energized. Fishkin et al teach the use of ultrasonic liquid jet to clean the side surfaces. Having the combined teachings of the cited documents it would have been obvious to an ordinary artisan at the time the invention was made to incorporate ultrasonic spray cleaning of Fishkin et al in the method of Moinpour et al instead or in addition to the spay of Moinpour et al to further enhance disclosed cleaning because the documents teach the action of brushes and ultrasonics to solve the same problem. An ordinary artisan would have been reasonably expected that the use of combined action would improve the side cleaning results. It would have also been obvious to include the referenced spray cleaning before, at the same point or after the brushing with reasonable expectation of adequate results in view of absence of unexpected results achieved by the claimed sequence of the steps. It is noted that Moinpour et al teach the use of their spray at or near the point of contact of the brush and the side surface (at least column 4, lines 42-45).

Moinpour et al and Fishkin et al do not specifically recite application of their methods to LCD substrates. Both of the documents are mainly directed to cleaning semiconductor wafers. Fishkin et al, however, teach that the method can be applied to glass substrates.

Hashimoto et al teach that the same method of cleaning are conventionally applied to semiconductor wafers and glass substrates, such LCD glass substrates.

The LCD substrates conventionally have a rectangular shape.

Having combined teachings of Moinpour et al, Fishkin et al and Hashimoto et al it would have been obvious to an ordinary artisan at the time the invention was made to apply a modified method of Moinpour et al to LCD glass substrates with reasonable expectation of success in order to have the substrates cleaned.

As to the limitation requiring moving of the substrate in a linear direction and the brushes being parallel to the referenced direction: it is noted that Moinpour et al show that in a scrubber the substrate is not only rotated, but also is moving through the scrubber in a linear direction. See at least Figure 3 the related description. It would have been obvious to an ordinary artisan at the time the invention was made that the brushes shown on Figures 2c, 6, and 7 should be parallel to the direction of the movement at least at some time to enable the movement.

As to the limitation requiring cleaning of two side surfaces: It would have been obvious to an ordinary artisan at the time the invention was made that all surfaces of the LCD substrate should be cleaned. It would have been obvious to an ordinary artisan at the time the invention was made to provide and use an additional brush and an

additional spraying device of Fishkin et al in the modified method of Moinpour et al in order to clean opposing surfaces of the LCD substrate in a single move in order to enhance cleaning. It is noted that, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

As to the limitation of the thickness of the substrate being about 0.7 mm:

The applicants admitted in the specification that substrates for LCD displays have thickness of 0.7 mm (at least page 3, lines 12-18).

It would have been obvious to an ordinary artisan at the time the invention was made to apply the modified method of Moinpour et al to any conventional LCD substrate, including the conventional substrates with the thickness of about 0.7 mm in order to have them cleaned because nothing on the record prevents application of the modified method to any conventional LCD substrate and because applicants admitted that conventional LCD substrates have thickness of 0.7 mm.

8. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moinpour et al (US Patent No 5,901,399) in view of Fishkin et al (US Patent No 6,202,658), Hashimoto et al (US Patent No 6,261,378).

Moinpour et al and Fishkin et al both teach cleaning substrates with brushes and sprays. Both documents are concerned about cleaning side surfaces of the substrates during cleaning of the main surfaces. Both documents teach brushing of the main surfaces and spraying the side surfaces. Moinpour et al teach the use of cylindrical brushes and a liquid jet to clean the side surfaces. See at least Figures 2c, 3, 6 and 7

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and the related description. The document does not specify whether or not the liquid jet is energized. Fishkin et al teach the use of ultrasonic liquid jet to clean the side surfaces. Having the combined teachings of the cited documents it would have been obvious to an ordinary artisan at the time the invention was made to incorporate ultrasonic spray cleaning of Fishkin et al in the method of Moinpour et al instead or in addition to the spray of Moinpour et al to further enhance disclosed cleaning because the documents teach the action of brushes and ultrasonics to solve the same problem. An ordinary artisan would have been reasonably expected that the use of combined action would improve the side cleaning results. It would have also been obvious to include the referenced spray cleaning before, at the same point or after the brushing with reasonable expectation of adequate results in view of absence of unexpected results achieved by the claimed sequence of the steps. It is noted that Moinpour et al teach the use of their spray at or near the point of contact of the brush and the side surface (at least column 4, lines 42-45).

Moinpour et al and Fishkin et al do not specifically recite application of their methods to LCD substrates. Both of the documents are mainly directed to cleaning semiconductor wafers. Fishkin et al, however, teach that the method can be applied to glass substrates.

Hashimoto et al teach that the same method of cleaning are conventionally applied to semiconductor wafers and glass substrates, such LCD glass substrates.

The LCD substrates conventionally have a rectangular shape.



Having combined teachings of Moinpour et al, Fishkin et al and Hashimoto et al it would have been obvious to an ordinary artisan at the time the invention was made to apply a modified method of Moinpour et al to LCD glass substrates with reasonable expectation of success in order to have the substrates cleaned.

As to the limitation requiring moving of the substrate (surfaces of the substrate) in a direction and rotating the brushes "by rotational direction" perpendicular to the moving direction of the substrate: it is noted that Moinpour et al show that in a scrubber the substrate is not only rotated, but also is moving through the scrubber in a linear direction. See at least Figure 3 the related description. It would have been obvious to an ordinary artisan at the time the invention was made that the brushes shown on Figures 2c, 6, and 7 should be parallel to the direction of the movement at least at some time to enable the movement, such would meet the limitation of rotating the brushes "by rotational direction" perpendicular to the moving direction of the substrate.

As to the limitation requiring cleaning of two side surfaces: It would have been obvious to an ordinary artisan at the time the invention was made that all surfaces of the LCD substrate should be cleaned. It would have been obvious to an ordinary artisan at the time the invention was made to provide and use an additional brush and an additional spraying device of Fishkin et al in the modified method of Moinpour et al in order to clean opposing surfaces of the LCD substrate in a single move in order to enhance cleaning. It is noted that, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

***Response to Arguments***

9. Applicant's arguments filed 8/19/10 have been fully considered but they are not persuasive.

The applicants allege that the jetting devices 35 of Fishkin et al are for cleaning both the side surface and the major surfaces. The applicants further allege that Fishkin et al need further more process time than the present invention.

This is not persuasive.

First, the applicants have not provided any evidence or reasoning to support the allegation regarding the process time.

Second, the claims are not limited to exclude application of the jet to any other surface.

Third, the claims are not limited to any specific process time.

Fourth, in contrast to the applicants' unsupported allegation, Fishkin et al teach the use of jet 35 for cleaning the side surface without cleaning main surfaces (at least, column 4, lines 6-11). Fishkin et al teach the simultaneous use of a brush scrubber or a similar cleaning mechanism for cleaning main surfaces (at least column 4, lines 24-32).

New claim 45 has been addressed in the rejections above.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 571-272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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